

## 231 Quiz 5

February 24, 2011

Name: \_\_\_\_\_

Name: \* key \*

Name: \_\_\_\_\_

Work in groups but do not split up problems or tasks. You must discuss each problem as a group and agree on a final answer. Hand in one quiz per group.

You may use your hand-written Notebooks but no other materials and no technology at all. Please keep your discussions quiet so as not to disturb or inform other groups.

1. Calculate the following limits. You must justify your answers with algebraic calculations and show your work clearly and in order if you want full credit.

a)  $\lim_{x \rightarrow 0^+} \frac{x + \sqrt{x}}{\sqrt{x}} \rightarrow \frac{0}{0} \text{ ind.}$

$= \lim_{x \rightarrow 0^+} \frac{\sqrt{x}(\sqrt{x} + 1)}{\sqrt{x}} = \lim_{x \rightarrow 0^+} (\sqrt{x} + 1) = \sqrt{0} + 1 = \boxed{1}.$

6 pts

b)  $\lim_{x \rightarrow \infty} \frac{1 - 3x^2}{(x - 1)(2x + 1)} \rightarrow \frac{-\infty}{\infty} \text{ ind.}$

$= \lim_{x \rightarrow \infty} \frac{1 - 3x^2}{2x^2 - x - 1} \cdot \frac{(\frac{1}{x^2})}{(\frac{1}{x^2})} = \lim_{x \rightarrow \infty} \frac{\frac{1}{x^2} - 3}{2 - \frac{1}{x} - \frac{1}{x^2}} = \frac{0 - 3}{2 - 0 - 0} = \boxed{\frac{-3}{2}}.$

6 pts

c)  $\lim_{x \rightarrow 1} \frac{\frac{1}{x} - 1}{x - 1} \rightarrow \frac{1 - 1}{1 - 1} = \frac{0}{0} \text{ ind.}$

$= \lim_{x \rightarrow 1} \frac{\left(\frac{1-x}{x}\right)}{x-1} = \lim_{x \rightarrow 1} \frac{(\frac{1}{x})^{-1}}{x(x-1)} = \lim_{x \rightarrow 1} \frac{-1}{x} = \frac{-1}{1} = \boxed{-1}.$

6 pts

+ 2 free